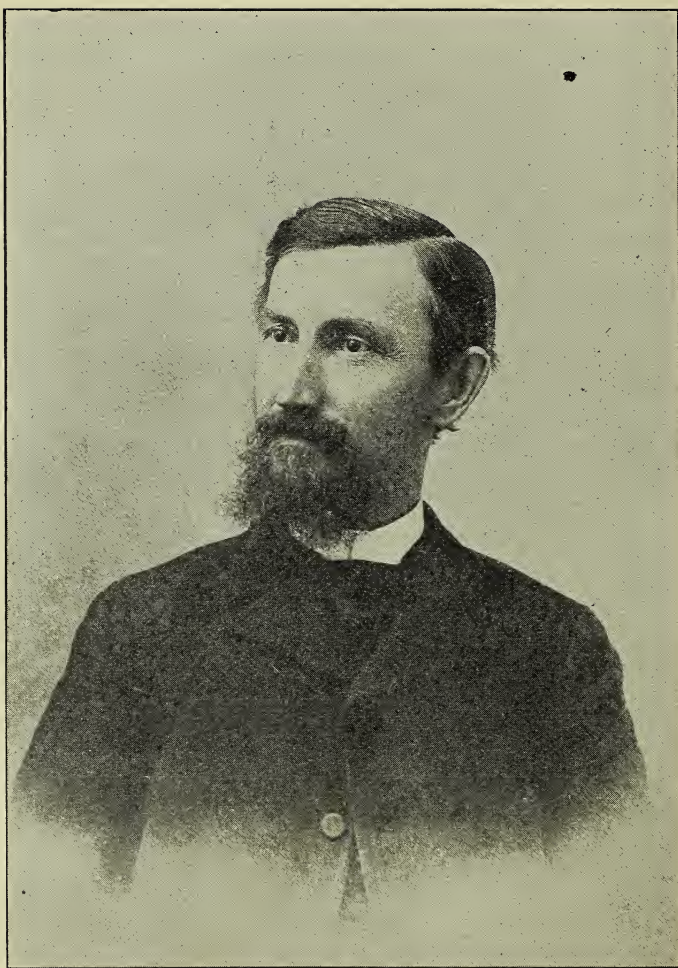


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CHARLES E. THORNE,
Director of Ohio Experiment Station.
[See page 129.]

THE AGRICULTURAL STUDENT.

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EDITORIAL CHAT.

The Farmers' Reading Course is fast taking its place along with the farmers' institutes and agricultural colleges as an important agent in the education of the farmer. It has been incorporated into the university extension work of a number of eastern institutions and is already found in some of the western. The first widely successful reading course for farmers in this country was established in connection with the Pennsylvania State College in 1892. Since then similar courses have been established in several of the state colleges, and usually under their supervision. An account of the work of these courses, shows that they have been wonderfully successful and that the interest is growing all the time. Ohio State University ranks among the first state colleges in the country, yet she is decidedly behind in this respect. The Ohio farmer will appreciate such a course of instruction as quickly as the farmers of any other state. Besides, we have the advantage of the experience of the states that have taken the initial steps. The subject is certainly worthy of careful consideration and we trust that soon Ohio will adopt a course of reading for the farmers of the state which shall be directly connected with the agricultural college.

The teaching of technical Agriculture in the rural schools has been advocated by many persons, among whom is the present Secretary of Agriculture. The proposition seems practical enough, but there arises some very serious objections. In the first place, supposing the plan practicable, there are very few teachers available for such schools who are qualified to teach the subjects proposed. The suggestion has been made that textbooks could be prepared to suit the needs of both teacher and pupil. If the farmer's children are to be taught to love the country and the farm in this manner, they must have teachers who are thoroughly acquainted with the subjects in hand and have a deep interest in the work themselves. No teacher can interest who is not himself interested and knows how to infuse some of his enthusiasm into his pupils.

A second objection sometimes urged is that the curriculum of the schools is already too long. The fault is not in the curriculum, but in the teaching, which in many cases has become merely mechanical.

These objections can be overcome, but the question arises in our mind whether, when we view the question impartially, the teaching of technical agriculture can be wisely and properly done in the rural school. Our free school system is

for the masses and not for the classes. We can see no more reason for teaching technical agriculture in the rural schools as they now exist than technical engineering or technical law. It is not to be expected, neither is it to be desired, that every farmer's son or daughter will become directly interested in farming, and it would be just as foolish to teach a future engineer technical agriculture as a future farmer technical law.

The times are demanding more and more an expert knowledge in every profession. A knowledge of some things is essential to everyone's individual welfare, and these things everyone should know, but the "all round man" will not succeed in the twentieth century. We cannot expect the common school to fit a boy for independence. All we can expect from them is a good basis of essential elementary knowledge, and a deep and abiding interest in some special line of work, to be successful in which he must spend years of further study.

What we need to attract the country boy and girl to the farm is not technical agriculture in the rural schools, but more competent teachers, thoroughly interested in their work, and with a real love for nature's charms, and the ability to draw constantly on her exhaustless storehouse of knowledge. The result will be to create and hold the interest of the pupil, and develop the natural bent of the child's mind. If that be along agricultural lines then he will stick to the farm. If not, do not destroy his interest in something else thinking to keep him there.

The reports of the numerous farmers' institutes held all over the state this winter show that one of the most common topics for discussion was the road question. It is indeed gratifying to see the interest deepening in this important question, and especially among those who will perhaps, more than any others,

be directly benefited by it. There can be no question as to the needs of better roads, but the methods of securing these and the cost of construction are the things over which the farmers hesitate. It has long since been shown that our roads might be much better if the money spent on them at present was wisely expended. Good roads will cost money, but by county construction and a system of long bonds the burden will be extended over a long period of time and will bear very lightly on any individual. This country has reached a point in its civilization where further development is very seriously retarded by the deplorable condition of the country roads. Increased prosperity has invariably followed the building of good roads in any community, and the price of real estate materially advanced. This is a matter in which every class of people is interested as well as the farmers, for it affects the whole commercial and economic conditions of the entire country. Let no one think therefore that they are not interested, but do all in their power to hasten the time when a complete network of broad, hard, dry, well-graded roads shall be spread over the entire country.

The Asparagus Club.

Judging from the sounds of merriment coming from Horticultural Hall the evening of February 20th, the program of the club for that evening was one of unusual interest, and so it was. The subject for discussion was the "Manufacture of Maple Syrup." Mr. Mason, whose father's syrup is noted throughout the state for its fine quality, gave an illustrated talk on the methods of manufacture which have proven so successful in their camp. The talk was followed by a lively discussion and questioning, after which Mr. Mason brought out some two gallons of the

product of their camp in form of syrup and sugar, clearly showing that in practice his theory was sound. The remainder of the evening can be better imagined than described, and after tendering Mr. Mason a vote of thanks for his interesting and instructive talk, as well as his generous "treat," the club adjourned.

Columbus Horticultural Society.

The regular monthly meeting of the society was held Saturday, February 24, in the office of the Board of Trade. On account of the weather the attendance was small, but the program was an excellent one. The leading paper was by professor Herbert Osborn on the "Dispersion and Control of Insects." The paper was one of unusual interest and full of practical suggestions to those who must constantly guard their crops from the destructive attacks of insects. J. C. Britton read a paper on "Some Recent Developments in Spraying." The most recent and scientific discoveries in this field were fully discussed and compared with each other in their practical use in garden and orchard.

Townshend Literary Society.

The society gave a Washington's birthday program Friday night, February 23. Mr. M. F. Miller read a paper on "The Observation of Washington's Birthday," and E. C. Cotton followed with a paper on "Washington as an Agriculturist." After music by the society quartette, Mr. T. L. Wheeler gave a recitation, "Washington's Farewell to His Army." The program closed by numerous extemporaneous speeches and music by the quartette.

Townshend is doing an excellent work in the department, and it is to be regretted that there is an agricultural student who is not an active member of the society. Graduate students are unanimous in saying that their work in the literary

society has been equal to a year's college work. Do not miss your opportunity, and if you are not a member become one immediately.

Dairymen's Association.

The sixth annual meeting of the Ohio State Dairymen's Association was held Tuesday and Wednesday, February 13th and 14th, in Townshend Hall. This Association meets once each year and the proceedings are always of great importance to the dairymen of the state. Last year it was decided to arrange for an exhibition of dairy products this year, and a committee was appointed to make all necessary arrangements. The experiment proved satisfactory beyond all expectations. The total entries numbered two hundred and eight, and together with the extensive displays of various manufacturers of dairy supplies, the exhibit elicited much comment from the numerous visitors. The interest displayed by dairymen in the exhibition feature will undoubtedly warrant a repetition of such exhibits each year.

The session Tuesday morning was opened by prayer and an address of welcome by Dr. Thompson, which was responded to by the President of the Association, Mr. D. A. Crowner. Mr. C. D. Hess, of Chillicothe, Ohio, presented the first paper on "Dairy Products from Stable to Table." This was followed by W. C. Whitehead, Pataskala, Ohio, on "Manufacture of Butter on the Farm," and the session closed by the appointment of several committees.

The other sessions were much longer, all of the papers being of a high standard of excellence, and eliciting much discussion. H. R. Heath, of Ossian, Ind., read a paper on "Making Butter from Pasteurized Cream." Major Henry Alvord, of Washington, D. C., talked on "American Progress in Dairying," and also on "American Dairy Products at

the Paris Exposition in 1900." Director C. S. Plumb, of Purdue University, read a paper on "Milking Machines" and conducted a "Practical Illustration in Judging and Scoring Cattle." Wednesday morning the dairy school was inspected while the students were at work. Professor Hunt gave a paper on "The Place of Roughage in the Ration for Cattle," and Director C. E. Thorne spoke on "Bovine Tuberculosis in Its Relation to Public Health."

The last session was devoted entirely to cheese making, ending with a paper by Professor Decker on "How Can We Make Better Cheese in Ohio."

The following officers were elected for the ensuing year: President, D. C. Stratton, Winona, O.; Vice President, Professor J. W. Decker, Ohio State University; Secretary-Treasurer, L. P. Bailey, Tacoma, Ohio; Directors, E. F. Smith, Columbus, O., and Professor J. F. Hickman, Wooster, Ohio. The Association voted by a large majority to hold the next session at the same place.

The following are the prizes awarded:

Class A.

Best tub creamery butter: Awarded to D. McCreary & Son, Urbana, O. Score 98.8. Premium \$15.

Second best tub creamery butter: Awarded to Reynoldsburg Elgin Butter Factory, Reynoldsburg, O. Score 98 1-3. Premium \$10.

Third best tub creamery butter: Awarded to White Rose Creamery, Lodi, O. Score 98 1-6. Premium \$5.

Class B.

Best 5 pound-prints dairy butter: Awarded to J. M. Winters & Sons, Owl Creek Dairy, Dawn, O. Score 99. Premium \$10.

Second best 5 pound-prints dairy butter: Awarded to Mrs. A. R. Collins, Xenia, O. Score 97 1-5. Premium \$5.

Third best 5 pound-prints dairy butter: Awarded to Chas. W. Embich,

Lancaster, O. Score 96 2-3. Premium \$3.

Class C.

Best American full cream cheese: Awarded to E. S. Rice, Triumph Dairy Co., Triumph, O. Score 98 5-6. Premium \$15.

Second best American full cream cheese: Awarded to L. D. Smith, Silo, O. Score 97 5-6. Premium \$10.

Third best American full cream cheese: Awarded to B. B. Herrick, Wellington, O. Score 79. Premium \$5.

Class D.

Best Swiss cheese: Awarded to Lewis F. Ladrach, Ragersville, O. Score 96 5-6. Premium \$15.

Second best Swiss cheese: Awarded to A. W. Ladrach, Axtel, O. Score 88. Premium \$10.

Third best Swiss cheese: Awarded to B. B. Herrick, Wellington, O. Score 70. Premium \$5.

Class E.

French Bros'. Dairy Co., Cincinnati, O., offer upon creamery butter is as follows:

Best tub creamery butter: Awarded to D. McCreary & Son, Urbana, O. Score 98.8. Premium \$20.

Second best tub creamery butter: Awarded to Reynoldsburg Elgin Butter Factory, Reynoldsburg, O. Score 98 1-3. Premium \$10.

Third best tub creamery butter: Awarded to White Rose Creamery, Lodi, O. Score 98 1-6. Premium \$5.

Class F.

The offer of Mr. L. P. Bailey, Tacoma, O., of one Jersey calf, registered in the American Jersey Cattle Club, and valued at \$50, for the best 5 pound-prints of dairy butter made by a lady, was awarded to Mrs. A. R. Collins, Xenia, O. Score 97 1-5.

Class G.

The Creamery Package Mfg. Co., 1, 3, 5 W. Washington street, Chicago, Ill.,

offer upon creamery butter is as follows:

Best tube creamery butter: Awarded to D. McCreary & Son, Urbana, O. Score 98.8. Premium 100 60-lb. tubs.

Second best tub creamery butter: Awarded to Reynoldsburg Elgin Butter Factory, Reynoldsburg, O. Score 98 1-3. Premium, Ideal heater.

Third best tub creamery butter: Awarded to White Rose Creamery, Lodi, O. Score 98 1-6. Premium, Ideal weigh can gate opener.

Class H.

Creamery Package Mfg. Co., 1, 3, 5 W. Washington street, Chicago, Ill., offer for full cream cheese is as follows:

Best American full cream cheese: Awarded to E. S. Rice, Triumph Dairy Co., Triumph, O. Score 98. Premium, 1 M. Excelsior Bdg., any size.

Second best American full cream cheese: Awarded to L. D. Smith, Silo, O. Score 97 5-6. Premium, 1 pail cheese grease.

Third best American full cheese: Awarded to McClellan & Son Cheese Factory, Cable, O. Score 82. Premium, Ideal weigh can gate opener.

Class I.

The offer of Wells & Richardson Company, Burlington, Vt., of a solid gold medal, with winner's name engraved, to the butter maker of creamery butter scoring highest on butter colored with Wells & Richardson Improved Butter Color, was awarded to George O'Brien, Forest, O. Score 97 1-3.

The premium of \$5, offered to the butter maker scoring second highest, was awarded to Thomas Higgins, Belle Center, O. Score 96.

Class K.

The offer of Wells & Richardson Company of \$5 to the highest scoring dairy butter colored with Wells & Richardson Co. Improved Butter Color, was awarded to Chas. W. Embich, Lancaster, O. Score 95 2-3.

The offer of \$1 to the second highest was awarded to Mrs. A. W. Bagshaw, Columbus, O. Score 92 2-3.

Class L.

The offer of Heller & Merz Co. of \$15 to the butter maker scoring highest upon butter colored with Alderney Butter Color, was awarded to Mrs. A. R. Collins, Xenia, O. Score 97 1-5.

The offer of \$10 to the butter maker scoring second highest was awarded to Chas. W. Embich, Lancaster, O. Score 96 2-3.

Director Charles E. Thorne.

Charles E. Thorne was born in 1846, on a farm in Green county, Ohio, and spent his early life thereon. He received the usual country district school education, which was supplemented by a few months at the Michigan Agricultural College in 1866, and a few terms at Antioch College in 1868-1869. In April, 1877, he was appointed foreman of the farm at the Ohio Agricultural and Mechanical College, now the Ohio State University. In December of the same year he was promoted to Farm Manager and continued in that capacity until 1881. As Farm Manager Mr. Thorne proved himself to be a thorough and conscientious experimenter and business man, and won the universal praise of his co-workers. Under his direction numerous improvements were made on the farm and its surroundings, the benefits of which we are now just beginning to reap. In October, 1882, he asked to be released from his connection with the college in order to accept the Assistant Editorship of *The Farm and Fireside*, in which position he continued until March, 1888. Ohio had learned the worth of Mr. Thorne as an experimentalist and careful business man, and in June, 1887, he was appointed Director of the Ohio Agricultural Experiment Station, and took charge of the

work in April of the next year. Of his work as Director we can add nothing to what is already known. Mr. Thorne has always been an indefatigable worker and it has been largely through his efforts that the Ohio Station has been

placed among the very foremost of the country. Not only the farmers of Ohio but the farmers of the whole country have been benefited by his investigations and discoveries. He may be truly called a benefactor to mankind.



W. I. BUCHANAN,
Director-General of the Pan American Exposition.

The Pan-American Exposition.

No effort is being spared to make the Pan-American Exposition, which will be held at Buffalo, N. Y., during the summer months of 1901, the most successful exposition ever held in America.

While the world's exposition at Paris is attracting the attention of the people at present, Americans should and will not forget their own interests at home. Here the nations of the new world will meet in friendly competition to learn of each

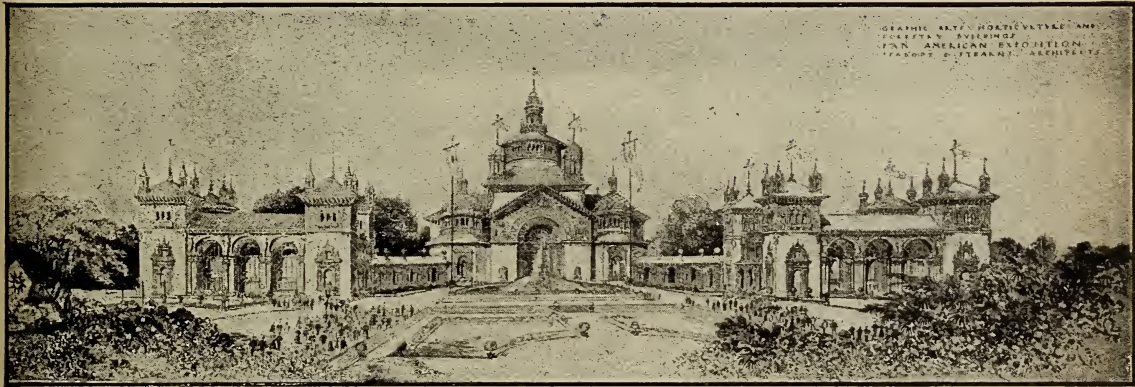
others progress and become better acquainted with each other.

We are indebted to the Department of Publicity for the following cuts and descriptive matter:

Buffalo, N. Y., February 20.

The position of director general of a great exposition such as will be the Pan-American, which will be held at Buffalo, on the Niagara Frontier, is, as the title implies, one of the very gravest responsibility. To hold such a position qualifications of the highest order are required, and executive ability and supreme authority must go hand in hand.

the fair he was offered the post of Minister to the Argentine by President Cleveland. When the administration changed Mr. Buchanan had so ingratiated himself with the leading men of the South American Republic, that a special request was made to President McKinley for Mr. Buchanan's retention, and he was allowed to remain undisturbed under a Republican administration until the importunities of the management of the Pan-American Exposition became so strong that he was persuaded to resign his portfolio to accept the position of director general of the great exposition.



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In the person of William I. Buchanan, late Minister to the Argentine Republic, the management of the coming fair realizes that a gentleman possessing all of the necessary qualifications has been secured.

Mr. Buchanan, who is in the prime of vigorous manhood, first came into prominence in exposition circles when he organized the Sioux City Corn Palace Exposition Company, and the great success made on that occasion caused the management of the World's Columbian Exposition to proffer Mr. Buchanan the position of superintendent of the agricultural department of the great Chicago Fair. In that position Mr. Buchanan did marvelous work, and at the close of

The three buildings for horticulture, graphic arts and forestry, of which Messrs. Peabody & Stearns are the architects, form a picturesque group at the end of the West Garden.

The largest of these, the Horticulture Building, stands between the other two on an axis with the garden. The Forestry Building is on the north side; the Graphic Arts on the south, adjoining the Lake. Arcades connect the three buildings, forming in front a semicircular court. Between the arcades the ground rises slightly to the level of the Fountain of the Seasons.

The area of the Horticultural Building is 45,000 square feet. The Graphic Arts and Forestry buildings each cover 30,000

square feet, and are similar in design. In plan the Horticultural Building is square, with central lantern, rising to a height of 240 feet at the intersection of the four arms of a Greek cross, which includes in its angles four small domes. On the center of each facade is a deeply recessed arched entrance.

The Graphic Arts and Forestry buildings have four corner towers, and on the east facade a vaulted loggia of three arches forms the main entrance. Above the red roofs of Spanish tile numerous lanterns, pinnacles and Venetian flagpoles, from which float gaily colored banners, add a festive picturesqueness to the skyline.

The broad white wall surfaces are ornamented with colored bas-reliefs. Arabesques of twining vines of fruit and flowers, among the branches of which are children and birds, decorate the numerous pilasters of the facades and arcades. Above the eastern entrance of the Horticultural Building are two colored compositions representing Ceres, the goddess of the harvest, bearing in her arms a sheaf of golden wheat. Her chariot is drawn by three lions led by Flora and Primavera.

The decoration of the Graphic Arts and Forestry buildings is chiefly confined to the vaulted ceilings of their loggias, where the brilliantly colored decorations remind one of the famous example of the Villa Madama.

Some Facts Concerning Oat Smut and Its Prevention.

As the season for seeding oats is drawing near, and in view of the fact that this is one of the staple crops of Ohio, particularly in the northern counties, it may not be out of place to present a few facts about this cereal and its most destructive enemy, the oat smut.

King the figures from our crop reports we learn that the average annual

yield of oats for Ohio is in round numbers 30,000,000 bushels, with an average value of 28 cents per bushel, giving a total crop value of \$8,400,000. It has also been estimated by good authorities that the average annual loss from oat smut is 6 per cent. of the total, thus giving \$504,000 which might and should go into the pockets of Ohio farmers. Figuring on the same basis we find that the average annual loss in the whole United States is over \$18,000,000. These figures certainly show what a great economic problem confronts us in regard to our oats crop.

The first question naturally asked is, Can this loss be prevented? The answer is, Very greatly so. The next question is, How?

There are several methods by which this may be done, and these are the hot water, the potassium, the ceres pulver, and the formalin treatments. The last three named have not been found as effective nor as easy of application or manipulation as the first mentioned, and, as a method that can be most practically used by the farmer is desired, I will briefly describe the hot water treatment as the one most desirable for use by him.

In the first place secure a tested and accurate thermometer, as the temperature of the water is a very important question. Then get a large barrel or hogshed of 60 or 70 gallons capacity, as the greater the volume of water, the easier is the temperature controlled and maintained at the proper degree.

If steam from a boiler is available conduct it through a pipe to near the bottom of the barrel; by this means the temperature is easily regulated. If steam cannot be had, heat the water in large kettles, and transfer to the barrel as needed. Have a readily accessible supply of cold water to add when necessary. A very good plan is to heat bricks or stones and drop them into the barrel

occasionally as they help to keep the temperature uniform. The temperature should be kept as nearly as possible at 133° F., and should not be allowed to vary more than two degrees either way, as deleterious effects will result either from not killing the smut spores or in injuring the oat germ.

To treat the oats place about a bushel in a fertilizer sack or more preferably in a wire mesh basket or perforated tin vessel, and immerse in the barrel. Shake occasionally to insure thorough contact of the water with each grain, and leave for twelve minutes; then hoist out of the water and allow to drain for a minute or two into the barrel. Next spread the oats uniformly on a clean floor where a draught or sunshine can be secured, and stir frequently with a rake to get it dried as soon as possible. If it is to be sacked before sowing, sterilize the sacks in a manner similar to the treatment of the oats.

By this method one man can treat and handle 35 or 40 bushels a day, and when we consider the great saving accomplished by this simple process, the labor involved is certainly a good investment. The oats, thoroughly freed from smut by treatment of the seed, if not grown on or near infected fields, may be kept free from the parasitic fungus for several years by a single treatment one year.

F. W. T.

Instruction in Domestic Science.

The Lasell Seminary at Auburndale, Newton, Massachusetts, claims the distinction of having established the first school of Domestic Science in America. This seminary was founded by Professor Edward Lasell about half a century ago and since 1874 has been in charge of Professor Charles C. Bragdon. It was he who originated the movement in this country. The idea was first suggested

to him by a visit to the South Kensington School in London, where he saw the work demonstrated.

After his return to America he established a course of Domestic Science in the Lasell Seminary and by lecturing and writing, placed his plan before the public. The project at once met with general approval. The course was begun in 1877, under the supervision of Miss Parloa, who has since attained a world-wide reputation for her work in this direction.

The course began with a scientific teaching of cookery and later included training in sewing, mending, millinery, dressmaking, etc., in conjunction with which was a study of the natural sciences with especial attention to their application to the affairs of home life.

The general outline of a course as it is offered in most of our colleges and universities today, may be well shown by quoting from an article in the "Home Kitchen Magazine," for September, 1897. It says: "The Ohio State University, at Columbus, has recently opened a school of domestic science. A two years' course is offered for those who have not the time or means to pursue the four years course. The regular outline includes one lecture and three laboratory periods a week. The latter are devoted to different branches of cookery, according to the course in progress, laundry work, plain sewing, designing, and drafting. The lectures cover a wide field, including principles of combustion, food economics, cuts of meats, general marketing, nutritive values, chemistry of the human body, the effect of cooking, situation and construction of the house, ordering of housework, household accounts, laundry work, nursing and first aids to the injured. Other lecture courses relate to the production and manufacture of different cloths, historic

costumes, art and its applications to the home, the history of domestic art."

Such a course, as presented in the above outline, is the result of numerous experiments and investigations which have been carried on by those interested in the work since its beginning. Due regard has been paid to all its phases and requirements and the study of the natural sciences is carried along with the practical work.

Instruction in domestic economy was begun in the Iowa Agricultural College in 1869, on the plan followed at Mt. Holyoke. That is, each young woman was required to spend several hours each day in the kitchen, dining-room, pantry or halls, under the supervision of the matron. No attempt was made at scientific training, however, until later. At present the same general plan is pursued there as elsewhere.

Storrs Agricultural College was also one of the pioneers in establishing this department.

The colleges and universities of the west have been more liberal toward the movement than those of the east, but as the aims and purposes of such a course become better understood and its sterling worth becomes recognized, the demand for instruction, in this branch of education, increases.

Among those state and agricultural colleges that have been foremost in establishing chairs in Domestic Science are South Dakota Agricultural College, Michigan Agricultural College, Tennessee State University, Utah Agricultural College, University of Idaho, Montana State College, University of Nebraska, and Ohio State University.

M. F. H.

Reflex Epilepsy.

About three weeks prior to the Christmas holidays, one of our regular pat-

rons, a leading horse dealer in the city, sought our advice in regard to a mare which he had recently purchased. He had bought the mare of another dealer on his assurance that the mare was perfectly sound. He described her as an animal of very striking appearance, being of unusually good conformation, a light dun in color with a long flaxen mane and tail, weighing about 950 pounds, and standing about fifteen hands high. He was so much pleased with her that he decided to keep her for his own driving, she being an excellent driver, free and perfectly safe and gentle. He detected nothing wrong with her for some days, although a fellow dealer, seeing her in his barn, told him that she much resembled a mare which he himself had owned some months previously and had proven to be what he termed "fitty." Our friend's suspicions were aroused and he determined to see whether or not this was the case, so on returning to his stable from dinner that day, he drove her at a very sharp pace. On driving into the barn the mare seemed restless, pawed, picked up her front feet alternately and promptly had a fit then and there before he could unhitch her. Her fit, as he described it, closely resembled epilepsy, but as epilepsy is an almost unknown disease in the horse, we thought it might possibly be vertigo. We did not feel justified in giving him any encouragement and advised him to sell us the mare as we were anxious to study the case, but he could not afford to sell her for what we offered him, as he had too much money in her.

From the history thus gathered we thought it very probable that by watching the case a little, we could soon buy the mare, as livery dealers in the city would soon become acquainted with her and some one would get "stuck" and find it difficult to sell again. Accordingly, on the following Saturday, we visited the

celebrated "swap alley," where auctions of low grade horses are held every week, with the expectation of finding her for sale. We experienced no difficulty in finding her as every dealer of whom we inquired had owned her within a month or so and their tales of her performances were varied and amusing. We purchased her of her last owner after considerable haggling, in which we were ably assisted by several of her former owners. We found her exactly as described. We borrowed a rig of a friendly dealer and led her out to the University. She trotted up promptly behind the buggy and acted perfectly natural. After she had rested for a half hour we made a most careful examination of her. We were unable to find the slightest thing wrong with her beyond the fact that her pulse, 32, was perhaps a trifle slow for a horse of that size. We then put her on a lunging line and trotted her about until she was very warm, but she showed nothing beyond holding her head a little to one side when placed in the stall. She held her head in this manner whenever fed and would masticate rather slowly. She showed nothing more than this for several days until one morning when feeding was delayed until 10 o'clock. She started to feed in a perfectly natural way, but soon stopped for a moment and picked up one front foot and put her head down with neck strongly arched and lower lip retracted. This passed off in a moment and she resumed eating, but stopped again almost immediately and backed into the corner of the stall, reared up, then stepping forward she dashed heavily against the side of the stall and dropped on all fours again. She then circled about the stall taking very short steps, lifting her feet very high after the fashion of a high school horse in the so-called Spanish walk. The head was held close to her breast with the lower lip retracted in a

most peculiar manner. She circled about in this manner several times, suddenly reared up, lost her balance and fell heavily to the ground. She lay there with legs twitching and trembling, head extended, muscles of neck hard and tense, eyes partly closed, jaws champing and sweat breaking out all over her body. This lasted three minutes or so when her muscles suddenly relaxed, her eyes opened and she raised her head and looked about in a dazed fashion. She seemed exhausted and lay prone upon her side for some minutes before getting up. After regaining her feet she resumed her feeding and seemed perfectly natural again. The attack lasted about twenty minutes. The next morning on feeding, she had another attack which was more severe and lasted about twice as long. We found that by feeding her late in the morning that we could produce an attack, and as we were anxious to photograph her attitude, if possible, we fed her about noon one day and led her outside at the first symptom. She showed practically the same symptoms as in the stall, except sometimes she would circle about so fast that her legs would get crossed and she would fall before she reared up. When down she was perfectly conscious and would get up if urged, only to fall again in a few moments when attack was resumed. We then prolonged the attack for some time and took a good number of photographs of her various attitudes. We kept her about ten days, during which time she grew rapidly worse, having sometimes as high as four fits in 24 hours. These attacks differed in many ways from true epilepsy, but especially so from the fact that the mare appeared conscious throughout, which is never the case in epilepsy. From the peculiar gait she assumed during an attack we suspected a lesion of the cerebellum and as she circled in either direction, right or left, it

seemed that whatever lesion existed was bilateral. As treatment was out of the question and the mare was liable to injure herself, we decided to destroy her, which was done by bleeding. A most careful post-mortem was made, revealing nothing abnormal except in the brain. At the base of cerebellum on either side a large blood clot was found, accompanied by a considerable thickening of the dura-mater, with effusion of serum. The case was one of unusual interest and but rarely met with in clinical practice. A complete history of the mare would be valuable and we have made every effort to trace her, but without success. She was 14 years old, free from blemishes, in splendid condition, and had evidently never been abused, indicating that some one had owned her for years and used her carefully, probably parting with her after her epileptiform fits had rendered her unsafe or unserviceable.

C. W. E.

Pruning Fruit Trees.

Pruning is not a very widely extended or popular practice. It has been carried on in France for many years, but mostly on the vine. In this state the habitual pruning of trees is limited to a comparatively few fruit growers.

An orchard that has been carefully pruned each year from the time of planting is far ahead of one that has been neglected, in a very great many respects. In appearance it is infinitely better. Spraying and cultivating, which have become necessary operations, are more easily accomplished, the fruit cannot be so easily shaken off by the wind, the cost of harvesting is greatly lessened for the reason that the trees are not so high when "heading in" is practiced. I have picked all the fruit from nine-year-old peach trees using only a five-foot stepladder. A better grade of fruit is obtained by rea-

son of the fact that thinning is accomplished by pruning, and the setting of an excessive amount of fruit is prevented. When pruning is done judiciously a crop of fruit is nearly always insured. Failures are often due to an over-production of fruit the previous year, and this over-production is always prevented by careful pruning. The man who prunes often gets a crop when others fail, and we well know what that means.

The time to prune is not on a fixed date or in any certain month. Any time will do during the winter when the trees are dormant. Some growers advocate pruning in the summer, but this is certainly injurious, as the sap at this time is quite active and excessive "bleeding" is the result.

How to prune is perhaps the most important question of all. There is one very important principle that must be borne in mind: Prune against the persistent and injurious tendencies of the tree. If a tree tends to grow rapidly up into the air, cut it back and encourage lateral branches. Or if a tree persists in spreading, cut it in from the sides. The branches of a Bartlett pear tree often curve in and grow towards the center causing great interference. These should be cut back just above a twig that points outward, and thus encourage lateral development. Sometimes trees will develop irregularly and grow sidewise. This may be remedied by heavy pruning on the heavy side, or a heavy limb may be drawn around into the open space and tied in place until it becomes fixed.

If pruning is begun early it never becomes a tedious or difficult task. In fact it should be done from the time the trees are planted. The young trees are long and whip-like and usually need to be cut back slightly. If any of the roots are torn or mutilated they should be removed by a clean, smooth cut by a sharp knife. The next year after setting, branches will

appear on the side of the trunk and from the crown of the tree. These should always be removed. The first branches on a peach tree should be at least four feet from the ground, and on an apple tree about five or six feet. A peach tree should never be allowed to branch out immediately above the ground. The usual result of such branching is that the first heavy crop of fruit splits off the branches, ruining the tree.

"Heading in" is the process of cutting back the previous summer's growth. The new branches should be cut back to within five or six fruit buds of the old wood. This method, of course, allows the trees to heighten to the extent of eight or nine inches each year, and they will, after a time, become too high. But some winter when it is certain the crop has been killed, a total cut may be made and the trees lowered two or three feet. If this severe pruning be done on an off year no fruit will be lost by the operator. Some years ago I was asked by a fruit grower in Ottawa county if it would be advisable to severely cut back an old peach orchard. The orchard was an old one, the trees of which had been allowed to grow very tall and spreading. The trees were of no use as they were and I advised him to cut off the tops, which he did. It proved to be a wonderful stimulus and as a result he now has a young bearing orchard on top of those old snags.

The tools necessary for pruning consist of an ax for heavy cutting, a long handled Water's tree pruner for heading in the top and a pair of lopping shears for cutting branches that are too large for a pair of hand shears. When it is necessary to cut off branches up close to the body of the tree a common meat saw is a very good implement.

As pruning is always done during the winter months no valuable time is consumed; and when we consider the great benefits derived from it, it is plain that

the time required for the work could not be more profitably expended. Prune a few trees at least and watch the result.

J. C. BRITTON.

Organization of Industry.

To-day one can scarcely read a paper of any sort without finding some attack on the organization of industries. While there is just cause for apprehension, we are of the opinion that many of the tirades against trusts, etc., come from those who have not carefully studied the subject, and have been looking at a single example from which they have drawn general conclusions.

The question is undoubtedly one of great importance and one which effects the entire commercial world. It should be the more carefully and impartially studied, then, before we come to definite conclusions, and make dogmatic statements concerning it.

In an address before the United States Export Association, the President, Mr. F. B. Thurber, very clearly and forcibly states his views of the effects of "trusts" upon labor, capital and public interest. Mr. Thurber has had excellent opportunities to study the question and its effect on industry, and his opinions are worthy of consideration. He says:

For many years as a merchant and as President of the United States Export Commission, I have studied the effects of "trusts" on our commercial, industrial and political system. When I began, it was with a strong prejudice against them. I had no conception that they were a natural, economic development or that there was any rational basis for their existence. A careful study of their effect has materially changed my opinion.

The first prominent development of trust organizations in this country was in the consolidation of numerous lines of railroads, and the public mind feared exorbitant rates of transportation to the

detriment of the public interest, as the result. The average cost of sending a ton of freight one mile on thirteen of the most important railroads during 1865 was 3.08 cents; in 1895, 0.72 cents. These railroads performed one-third of the entire transportation of 1895, and the figures show that 0.72 cents would pay for as much transportation in 1895 as 3.08 cents would thirty years earlier.

The next prominent aggregation of capital was the Standard Oil Company, and the effect upon the price has been as follows: The price of refined illuminating oils per gallon, exported from the United States in 1871, was 25.7 cents; in 1880, 8.6 cents; in 1890, 7.4 cents; in 1898, 5.7 cents. This decline in price of oil is partly due to the increase in production, but more largely due to improvements in manufacture and transportation attainable only through the aggregation of capital.

Another prominent trust is the American Sugar Refining Company, which until recently did about eighty-five per cent. of the sugar refining in the United States. The price of raw sugar in 1887 was 5.24 cents per pound, refined 6.01 cents, leaving a difference of 0.768 cents; in 1890 raw sugar was 5.45 cents, refined 7.00 cents, difference 0.72 cents; in 1896, raw sugar was .63 cents, refined 4.539, difference 0.90 cents. This reduction in price has been effected by increased production, but largely through buying the raw material cheaper than when a large number of separate refiners were competing for the product. The company has bought its sugar cheaper and given the public the benefit of the purchase. It employs more labor and pays higher wages than was employed and paid before the organization of this industry.

"These illustrations are but types of many in the evolution of industries, which is the result of the great forces before mentioned and which have revolu-

tionized the entire economic situation. That there have been instances of hardship and injustice attending this revolution cannot be doubted, but it is equally certain that the total results have been beneficial to the public at large and to the interests of laboring classes especially, who constitute the majority. At some stages of this evolution this remark was, perhaps, not true. The action of these forces was so rapid that men were thrown out of employment faster than wants were created and industries widened. Labor, however, soon followed the example which capital had set of organization, and during the last decade the organization of labor has progressed faster than that of capital, and has forced a division of a larger share of the profits of industry for labor than at any previous period of history. In other words, the profits of capital have been steadily decreasing, while those of labor, and especially organized labor, have steadily increased. At no previous period would a dollar buy so much of the necessities and comforts of life as at present. While this is admitted by intelligent laboring men, many of them contend that opportunities for earning a dollar have constantly diminished, and they are now seeking, by the advocacy of shorter hours for labor, to make employment for a larger number of persons, and I believe that this is a worthy and beneficent aim. It is better to have a larger number of persons employed for eight hours than a smaller number of persons ten or twelve hours. Unrest of labor in a free country is not a dangerous phenomenon, but rather a safety valve, and one which capital can afford to encourage. At the same time it must not be forgotten that education of the masses has created new wants, and that these wants have grown faster than the means of gratifying them. The problem should be viewed from both sides, and only what is reasonable should prevail. Wherever unlimited power ex-

ists it is usually accompanied by tyranny, whether of labor or capital. There are labor trusts as well as capital trusts, and in all the annals of combination there are no greater illustrations of tyranny than the attitude of some of the labor organizations towards laborers. This, however, was the inevitable outcome of organization and of the evolution which is now going on throughout the world under the operation of the great forces that now control the world—steam, electricity and machinery. Under the operation of these forces the world has been growing richer. All the resources of nature are being developed. Capital has increased faster than the opportunities for its profitable employment, as is evidenced by the steadily decreasing rate of interest. I used to think that combinations of capital would abrogate competition, but experience has shown that, instead of abrogating competition, it has elevated that force to a higher plane. If a combination of capital in any line temporarily exacts a liberal profit, immediately capital flows into that channel, another combination is formed, and competition ensues on a scale and operates with an intensity far beyond anything that is possible on a smaller scale, resulting in a breaking down of the combination and the decline of profits to a minimum."

"The only trusts which have succeeded for any length of time are those which have been conducted on a far-sighted basis of moderate margins of profit, relying upon a large turn over and the economics resulting from the command of large capital intelligently administered. The truth of this is illustrated by innumerable failures in trust organizations to control prices, recent illustrations of which are the Strawboard Trust, the Starch Trust, the Wire Nail Trust and the old Steel Trust. There are trusts, so-called, in nearly every branch of business, and there is good

and bad in all, but the good so far predominates that such aggregations of capital should be encouraged, accompanied by safeguards against abuses. The only additional safeguards needed are for stockholders and investors, whose interests are often sacrificed through lack of publicity. The average investor is the chief sufferer. So far as the interest of consumers is concerned, it is amply protected now; first, by competition, as I have shown, and second, by the common law, which, if invoked, will nullify any contract or restraint of trade, and any unreasonable combination is subject to indictment for conspiracy. Special 'trust' statutes are not necessary, although many have been enacted."

"A large capitalization cannot increase earning power, but it may serve to conceal the percentage of earnings on the actual cost of some properties and furnish counters with which to juggle in the stock market. In many industrial properties the 'goodwill,' which is a property created by brains, industry, time and population, is the principal value. Unlike a railroad or gas company, this cannot be reproduced, and the sole measure of capitalization is its earning power. What other measure can there be to the capitalization of a newspaper or ordinary industrial company? Never before has there been so much necessity for caution and investigation on the part of investors."

"The theory has been advanced that the organization of industry into 'trusts' dwarfs individual effort and diminishes individual opportunity. I do not think this is true any more than the enlistment of bushwhackers in the regular army dwarfs effort and diminishes opportunity. The bravest, wisest and strongest naturally become officers in the organization of industry, and those less capable become the rank and file, with opportunity for promotion based on merit. Luck and opportunity, doubtless, have some-

thing to do with leadership, but the fact remains that steam, electricity and machinery have forced the organization of industry, and it is now a contest of nations for the trade of the world. We can not all be generals or admirals in industrial organization, but we can try for it, and it is better to be a good private than to be an eminent bushwhacker."

"The popular hostility to trusts is due principally to lack of knowledge of their economic effects, and these are gradually becoming better known. There were just enough abuses attending them to give an excuse for sensational journalistic denunciation, and this has caused undue prejudice. A great politico-economic question like this should be considered dispassionately, and all sides of it carefully investigated before conclusions are reached. As before stated, the result of my many years of study of it has been to materially modify the views I entertained in the beginning."

"I am not interested in trusts, except as a student of their politico-economic features, but I am satisfied that we must have this organization of industry if we would keep up with the procession in the march for the world's trade. There are 1,440,000,000 people in the world, of which we have 75,000,000, possessing a larger purchasing power than any similar number elsewhere and a larger producing power, because we command the great forces of nature and of brain power embodied in machinery to a greater extent than any other nation."

"With a consuming power of 75,000,000 we have a producing power of 150,000,000. Our problem is to keep our labor and capital continuously and remuneratively employed by preserving our home market and reaching out for a place to dump our surplus among the other 1,365,000,000, each of whom has some wants. There are natural wants and educational wants. The former are

principally those of the stomach, and in supplying these we have to compete with the fertile lands and cheap labor of the whole world. The educational wants are those of fashion or convenience."

"Mr. Chairman and gentlemen, upon the educational wants depend the prosperity of our country. Paris supplies the wants of fashion in woman's dress, the educational want in that line; England the fashions in men's apparel. We have thousands of inventions so much more convenient and useful than those now used by the people of the world that all our manufacturers have to do is to show them and they will find a market. But the peasant who has been plowing with a crooked stick or reaping with a sickle is satisfied until he has seen a mouldboard plow or a modern harvester; the student with the olive oil lamp or the tallow dip until he has seen the petroleum, gas, acetylene or electric light; the wooden-shod clodhopper or the sandal-shod Oriental with his footwear until he has seen that artistic and comfortable triumph of machinery, the American shoe."

"The same methods which we employ in introducing goods in the United States we must employ abroad. Publicity is the great factor, and this must be reached by the printing-press in the language of the various countries; by the personal representation of educated experts able to overcome the barrier of language imposed at the building of the Tower of Babel; by cutting canals and laying cables; by the up-building of an American commercial marine which will carry our flag and our goods on every sea, and by the establishing of international banks with a currency which will command the confidence of the great commercial countries of the world. Then will the Star of Empire, first progressing westward, shed its effulgence over the whole world. With it, in time, will come a universal coinage, a universal system of weights

and measures, a universal language and Tennyson's dream of 'the parliament of man, the federation of the world,' with the English-speaking race, led by the universal Yankee nation, as the evangel, will be realized. But don't let us shy at the boggy of the organization of capital, now called 'trusts,' which are an evolution of commerce, as natural and resistless as the tides. Steer them. Don't try to stop them, for they are necessary to economical production and distribution. Regulate them, temper them with the organization of labor, and work out 'the greatest good to the greatest number' on a basis of what is reasonable."

"The adjustments of the relations of labor and capital under these new conditions is one of the great problems to be solved. Time will not permit discussing them here, but I would recommend every thoughtful man, whether he be an employe, to read a book recently published on this subject, entitled, 'The Laborer and the Capitalist,' by F. O. Willey. It is a powerful argument for harmony, and a prominent clergyman recently said of it, that it was capable of doing more good than any other book except the Bible. Our motto should be, 'Labor and Capital—allies, not enemies; justice for both.'"

Book Reviews.

"Nature's Miracles," by Elisha Gray. Vol. I. World-Building and Life: Earth, Air, and Water. Cloth; pp. 243. Fords, Howard & Hulbert, New York. Price, 60 cents.

It is a fortunate thing that such an eminent scientist as Elisha Gray should find time to write a series of familiar talks on what he calls "Nature's Miracles," and that they should be placed easily within reach of everyone.

In this first volume dealing of Earth, Air, and Water. Professor Gray explains in familiar discourse the formation of the earth's crust, the soil and many

interesting facts concerning its component parts. Passing on to Air, the atmosphere, temperature, clouds, weather predictions, snow, ice, liquid air, etc., are discussed in the same popular style. Under Water he treats of rivers and floods, tides, water and ice, glaciers, the glacial period and its effects on surface, soils, and climates.

It is a most interesting little book, written, as the author says, for those who have not, and who cannot have, the advantages of scientific education, and for young readers who will be helped by these plain, general views of topics which their text-books will give them in detail. For popular and school libraries and for the "general reader" who is not spoiled for everything but fiction, this book must be of especial worth.

"Ornamental Shrubs," by Lucius D. Davis. Cloth; pp. 338. C. P. Putnam's Sons, New York. Price, \$3.50.

This volume is addressed to both scientific men and that large class of persons who, though interested in plants, have no knowledge of botany, and neither time nor inclination to acquire it. The phraseology is plain and the descriptions are easily comprehensible; yet the book contains material never before presented, relating to varieties of plants developed under cultivation.

It has been prepared in Newport, America's great summer resort, where, perhaps more than anywhere else in America, are to be found in practical use the combined horticultural treasures of the world. The author has improved the opportunity to watch the growth and cultivation in many of these gardens from the beginning and is thus able to write largely from personal observation of the plants in all stages of growth. Only those that have withstood the test of experience have been reviewed.

The science of Botany has to deal chiefly with fixed forms, as orders genera

and species, and cannot give a great deal of attention to the varietal forms constantly springing up every year both by natural processes and through the agencies of man. Many of these varieties are far more valuable for ornamental purposes than the originals and are displacing them. Many of the plants in the best gardens of the world are not named, much less described by the scientist. It is to these that especial attention is given. The attempt to publish in a single volume an account of the origin, capabilities and adaptations of the numerous species and varieties of shrubs, native and foreign—and especially of the new and rare sorts suited to cultivation in the United States—is an original one, and the book will be found of rare value to every one who is interested in shrubs as related to horticulture and ornamentation.

“The Chemistry of Soils and Fertilizers,” by Professor Harry Snyder, University of Minnesota. Cloth; pp. 272. Chemical Publishing Co., Easton, Pa. Price, \$1.50.

This book is indeed a valuable addition to the literature upon the subject treated, and will fill a long felt want in the courses of instruction in our agricultural colleges. The aim of the book is “to give, in condensed form, the principles of chemistry which have a bearing upon the conservation of soil fertility and the economic use of manures.”

The book contains chapters on the Physical Properties of soils Geological Formation and Classification of Soils, Chemical Composition of Soils, Nitrogen of Soil and Air, Nitrification and Nitrogenous Manures, Farm Manures, Commercial Fertilizers, Lime and Miscellaneous Fertilizers, and Rotation of Crops. There is also a list of references, a list of questions touching the most important points of the contents, and

a complete index, altogether making the book one to be desired by every thorough farmer and agricultural student.

“A History of Ohio Agriculture” is the title of the latest addition to the history of the progress of the State of Ohio.

The book is now on the press and will appear very soon. The author is Professor C. W. Burkett of the New Hampshire State College, formerly of Ohio State University. Professor Burkett has made a careful study of the subject for several years and in his clever and fascinating style the history of this phase of the state's progress is extremely attractive and interesting reading.

The work of the historian is to gather together the scattered facts; sift the true from the false, the real from the fictitious, and place them in their proper relation to the subject and to each other. In this the author has succeeded remarkably well, treating very fully the development and evolution of the various phases of farm life in Ohio. There are chapters on Soil and Climate, Indian Agriculture in Ohio, Pioneer Farmer, Canals and Railroads in Relation to Agriculture, Improvements in Breeds of Cattle, Development of Sheep, Origin and Development of Breeds of Swine, Dairying, Agricultural Education, Agricultural Fairs, Farmers' Institutes, Experiment Stations and Agricultural Colleges, together with chapters on other relative subjects.

The book will contain over 200 pages, neatly and attractively bound in cloth. Send orders to the author, Professor C. W. Burkett, Durham, N. H. Price, \$1.50.

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